CUBIT Capability Proposal

Technical Area Geometry, Meshing, Infrastructure, GUI, Graphics, etc..	**Technical Lead** Cubit Developer in charge of technical area
Meshing	Matt Staten?

MRD Description

Describe the capability in terms of how a user would see it.

Generate large tet meshes for assembly models in much shorter time. Eventually, extend this capability to hex meshes.

SRS Description

What needs to be done by Cubit developers to implement this capability? Break the tasks into steps if applicable. (Steps should be on the order of 2 man-weeks or more)

1. Upgrade current standalone parallel meshing capability to CAMAL and latest version of CUBIT. 2. Implement file-based job control and data communication between CUBIT and parallel tet meshing, such that it's transparent to the user. 3. Implement library-based job control and data communication between CUBIT and parallel tet meshing.

Justification

Describe why this is important and what impact it will have if it is implemented. (or not implemented).

Generating large tet meshes requires some interaction, for specifying size and scheme, punctuated by long periods waiting for the mesh to be generated; this is especially true later in the meshing process, when small changes are made to mesh input parameters. Parallel meshing would greatly reduce these times (speedups of 20x and more have been demonstrated, even for moderately sized, ~10M element tet meshes). This would speed up the meshing process, and simplify it by removing the need for the user to multitask during wait periods.

Resources Who will work on this	**Time estimate** How much time will it take in man-weeks	**Targeted Release** 10.2 (August 06), 10.3 (March 2007), 10.4 (August 2007), Future (beyond FY07)
Tim Tautges	3 months	10.2 (file-based), 10.3 (library-based)

Submitted By:	**Date:**
Tim Tautges	4/4/06